MODEL

- BOSS Inverter MIG 165
- BOSS Inverter MIG 200

Operating Manual
(Owner's Manual)

IMPORTANT: Read these instructions before installing, operating, or servicing this system.

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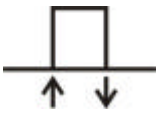
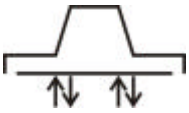
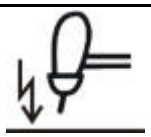
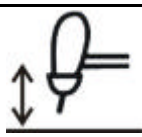
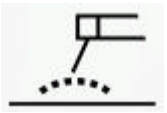
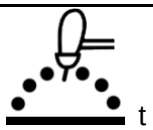
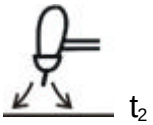
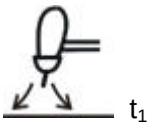
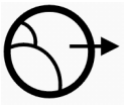
SYMBOL LEGEND

A	Amperage
V	Voltage
Hz	Hertz (frequency)
SEC	Seconds
%	Percent
⎓	DC (Direct Current)
∿	AC (Alternating Current)
	2T (GTAW)
	4T (GTAW)
	Repeat Function (GTAW)
	Spot Function (GTAW)
	High Frequency Starting (GTAW)
	Lift Start （GTAW）

	Stick (SMAW)
	Pulse Current Function (GTAW)
 t	Spot Time (GTAW)
	Remote outputs control (Panel/Remote)
	Remote Function
	Arc Control (SMAW)
 t_2	Gas Post-Flow Time
 t_1	Gas Pre-Flow Time
VRD	Voltage Reduction Device Circuit
—	Negative
+	Positive
	Gas Input
	Gas Output

STATEMENT OF WARRANTY

LIMITED WARRANTY: "BOSS" warrants to customers of its authorized distributors hereafter "BOSS" that its products will be free of defects in workmanship or material. Should any failure to conform to this warranty appear within the time period applicable to the BOSS products as stated below, BOSS shall, upon notification thereof and substantiation that the product has been stored, installed, operated, and maintained in accordance with BOSS's specifications, instructions, recommendations and recognized standard industry practice, and not subject to misuse, repair, neglect, alteration, or accident, correct such defects by suitable repair or replacement, at BOSS 's sole option, of any components or parts of the product determined by BOSS to be defective.

The BOSS COMPANY MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED. THIS WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHERS, INCLUDING, BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

LIMITATION OF LIABILITY: BOSS shall not under any circumstances be liable for special, indirect or consequential damages, such as, but not limited to, lost profits and business interruption. The remedies of the Purchaser set forth herein are exclusive and the liability of BOSS with respect to any contract, or anything done in connection therewith such as the performance or breach thereof, or from the manufacture, sale, delivery, resale, or use of any goods covered by or furnished by BOSS whether arising out of contract, negligence, strict tort, or under any warranty, or otherwise, shall not, except as expressly provided herein, exceed the price of the goods upon which such liability is based. No employee, agent, or representative of BOSS is authorized to change this warranty in any way or grant any other warranty.

PURCHASER'S RIGHTS UNDER THIS WARRANTY ARE VOID IF REPLACEMENT PARTS OR ACCESSORIES ARE USED WHICH IN BOSS'S SOLE JUDGEMENT MAY IMPAIR THE SAFETY OR PERFORMANCE OF ANY BOSS PRODUCT. PURCHASER'S RIGHTS UNDER THIS WARRANTY ARE VOID IF THE PRODUCT IS SOLD TO PURCHASER BY NON-AUTHORIZED PERSONS.

The warranty is effective for the time stated below beginning on the date that the authorized distributor delivers the products to the Purchaser. Not with standing the foregoing, in no event shall the warranty period extend more than the time stated plus one year from the date BOSS delivered the product to the authorized distributor.

POWER SUPPLIES	**POWER SUPPLIES & WIRE FEEDERS**
MAIN POWER MAGNETICS (STATIC& ROTATING)	1YEAR
ORIGINAL MAIN POWER RECTIFIER	1YEAR
POWER SWITCHING SEMI-CONDUCTORS & CONTROL PC BOARD	1YEAR
ALL OTHER CIRCUITS AND COMPONENTS INCLUDING BUT NOT LIMITED TO, CONTACTORS, RELAYS, SOLENOIDS, PUMPS, SWITCHES, MOTORS	1YEAR

Warranty repairs or replacement claims under this limited warranty must be submitted to BOSS by an authorized BOSS repair facility within thirty (30) days of purchaser's notice of any Warranty Claim. No transportation costs of any kind will be paid under this warranty. Transportation charges to send products to an authorized warranty repair facility shall be the responsibility of the Purchaser. All returned goods shall be at the Purchaser's risk and expense. This warranty supersedes all previous BOSS warranties.

1.0 GENERAL INFORMATION

1.01 Notes, Cautions and Warnings

Throughout this manual, notes, cautions, and warnings are used to highlight important information. These highlights are categorized as follows:

NOTE

An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

CAUTION

A procedure which, if not properly followed, may cause damage to the equipment.

WARNING

A procedure which, if not properly followed, may cause injury to the operator or others in the operating area.

1.02 Important Safety Precautions

WARNING

OPERATION AND MAINTENANCE OF ARC WELDING EQUIPMENT CAN BE DANGEROUS AND HAZARDOUS TO YOUR HEALTH.

To prevent possible injury, read, understand and follow all warnings, safety precautions and instructions before using the equipment. Call your local distributor if you have any questions.

GASES AND FUMES

Gases and fumes produced during the Arc welding or cutting process can be dangerous and hazardous to your health.

- Keep all fumes and gases from the breathing area. Keep your head out of the welding fume plume.
- Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.
- The kinds of fumes and gases from the arc welding/cutting depend on the kind of metal being used, coatings on the metal, and the different processes. You must be very careful when cutting or welding any metals which may contain one or more of the following:
  Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Lead Manganese Mercury Nickel Selenium Silver Vanadium
- Always read the Material Safety Data Sheets (MSDS) that should be supplied with the material you are using. These MSDSs will give you the information regarding the kind and amount of fumes and gases that may be dangerous to your health.
- Use special equipment, such as water or down draft welding/cutting tables, to capture fumes and gases.
- Do not use the welding torch in an area where combustible or explosive gases or materials are located.
- Phosgene, a toxic gas, is generated from the vapors of chlorinated solvents and cleansers. Remove all sources of these vapors.

ELECTRIC SHOCK

Electric Shock can injure or kill. The arc welding process uses and produces high voltage electrical energy. This electric energy can cause severe or fatal shock to the operator or others in the workplace.

- Never touch any parts that are electrically “live” or “hot.”
- Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the welding circuit.
- Repair or replace all worn or damaged parts.
- Extra care must be taken when the workplace is moist or damp.
- Install and maintain equipment according to NEC code, refer to relative standards
- Disconnect power source before performing any service or repairs.
- Read and follow all the instructions in the Operating Manual.

FIRE AND EXPLOSION

Fire and explosion can be caused by hot slag, sparks, or the arc weld.

- Be sure there is no combustible or flammable material in the workplace. Any material that cannot be removed must be protected.
- Ventilate all flammable or explosive vapors from the workplace.
- Do not cut or weld on containers that may have held combustibles.
- Provide a fire watch when working in an area where fire hazards may exist.
- Hydrogen gas may be formed and trapped under aluminum workpieces when they are cut underwater, or while using a water table. Do not cut aluminum alloys underwater or on a water table unless the hydrogen gas can be eliminated or dissipated. Trapped hydrogen gas that is ignited will cause an explosion.

NOISE

Noise can cause permanent hearing loss. Arc welding/cutting processes can cause noise levels to exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

- To protect your hearing from loud noise, wear protective ear plugs and/ or ear muffs. Protect others in the workplace.
- Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.

ARC WELDING RAYS

Arc Welding/ Cutting Rays can injure your eyes and burn your skin. The arc welding/cutting process produces very bright ultra violet and infra red light. These arc rays will damage your eyes and burn your skin if you are not properly protected.

- To protect your eyes, always wear a welding helmet or shield. Also always wear safety glasses with side shields, goggles or other protective eye wear.
- Wear welding gloves and suitable clothing to protect your skin from the arc rays and sparks.
- Keep helmet and safety glasses in good condition. Replace lenses when cracked, chipped or dirty.
- Protect others in the work area from the arc rays. Use protective booths, screens or shields.

1.03 Transporting methods

These units are equipped with a handle for carrying purposes.

WARNING: ELECTRIC SHOCK can kill.

DO NOT TOUCH live electrical parts. Disconnect input power conductors from de-energized supply line before moving the welding power source.

WARNING: FALLING EQUIPMENT can cause serious personal injury and equipment damage.

- Lift unit with handle on top of case.
- Use handcart or similar device of adequate capacity.
- If using a fork lift vehicle, place and secure unit on a proper skid before transporting.

2.0 INSTALLATION RECOMMENDATION

Installation Environment

INVERTER MIG Series is designed for use in hazardous environments.

Examples of environments with increased hazardous environments are -

In locations in which freedom of movement is restricted, so that the operator is forced to perform the work in a cramped (kneeling, sitting or lying) position with physical contact with conductive parts; In locations which are fully or partially limited by conductive elements, and in which there is a high risk of unavoidable or accidental contact by the operator, or in wet or damp hot locations where humidity or perspiration considerable reduces the skin resistance of the human body and the insulation properties of accessories.

Environments with hazardous environments do not include places where electrically conductive parts in the near vicinity of the operator, which can cause increased hazard, have been insulated.

Installation Location

Be sure to locate the welder according to the following guidelines:

- In areas, free from moisture and dust.
- In areas, free from oil, steam and corrosive gases.
- In areas, not exposed to direct sunlight or rain.
- Ambient temperature: between -10 degrees C to 40 degrees C.
- In areas, not subjected to abnormal vibration or shock.
- Place at a distance of 304.79mm or more from walls or similar that could restrict natural airflow for cooling.

WARNING 1

BOSS advises that this equipment be electrically connected by a qualified electrician.

The following Primary Current recommendations are required to obtain the maximum welding current and duty cycle from this Power Supply:

Model	Primary supply lead size	Minimum primary current circuit size	Current & Duty Cycle
Inverter Mig 165	Minimum 5mm^2	220V/ 26.3A 240V/ 24.1A	160A/22V@60% 140A/21V@100%
Inverter Mig 200	Minimum 6mm^2	220V/ 37A 240V/ 33.9A	200A/24V@60% 180A/23V@100%

Table 1 Primary current circuit sizes to achieve maximum current

2.01 Electrical Input Connections

> **WARNING:** ELECTRIC SHOCK can kill; SIGNIFICANT DC VOLTAGE is present after removal of input power.

DO NOT TOUCH live electrical parts

SHUT DOWN welding power source, disconnect input power employing lockout/ tagging procedures. Lockout/ tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

Electrical Input Requirements

Operate the welding power source from a single phase 50/ 60 Hz, AC power supply. The input voltage must match one of the electrical input voltages shown on the input data label on the unit nameplate. Contact the local electric utility for information about the type of electrical service available, how proper connections should be made, and inspection required.

The line disconnect switch provides a safe and convenient means to completely remove all electrical power from the welding power supply whenever necessary to inspect or service the unit.

According to Table 1 and below as a guide to select line fuses for the disconnect switch.

Input Voltage	Fuse Size	Model
220/240V AC	60 Amps	Inverter Mig 165, 200

Table 2

Notice: Fuse size is based on not more than 200 percent of the rated input amperage of the welding power source (Based on Article 630, National Electrical Code).

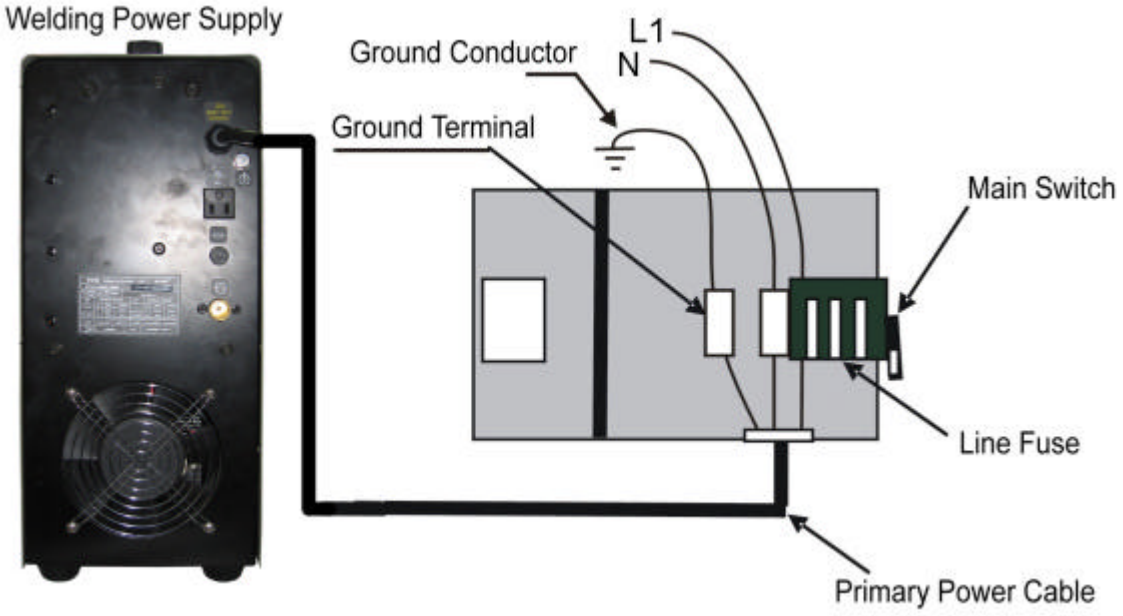


Figure 1 Electrical input connections

2.02 Installation of MIG/MAG

- Connect the work lead to negative (-) socket (positive (+) for special wire).
- Connect the gun lead to the positive (+) socket (negative (-) for special wire).
- Position a gas cylinder on the rear tray and lock securely to the power supply cylinder bracket with the chain provided. If this arrangement is not used then ensure that the gas cylinder is secured to a building pillar, wall bracket or otherwise securely fixed in an upright position.
- Fit the gas regulator/ flowmeter to the gas cylinder (choose different gas according to wire: CO_2, mixed gas, argon and so on).
- One dual groove feed rollers are supplied as standard with the power supply. These can accommodate 0.8mm and 1.0mm diameter hard wires. Select the roller required with the chosen wire size marking facing outwards.
- Fit the electrode wire spool to the wire reel hub.
- Lift up the wire feeder pressure lever and lift the electrode wire to the entrance of the gun.
- Lower the pressure lever and with the gun lead reasonably straight, feed the wire through the gun, till to extend from the hole in the middle of contact tip.
- Regulate the current, voltage to the value required according to the thickness of work piece (short circuit transition, dip transition, and spray transition can be produced according to different regulated current , voltage).
- Install appropriately, there is no faulty after inspecting, you can start welding.

	Wire Size				
WF 82E ×1	Idle Roll ×1		2WZKIDLE001		
	Drive Roll	0.6/0.8mm	2WZKVY0R6X0R8	2WZKKVY0R6X0R8	2WZKUL0R6X0R8
		0.8/1.0mm	2WZKVY0R8X1R0	2WZKKVY0R8X1R0	2WZKUL0R8X1R0
		0.9/1.2mm	2WZKVY0R9X1R2	2WZKKVY0R9X1R2	2WZKUL0R9X1R2
		1.0/1.2mm	2WZKVY1R0X1R2	2WZKKVY1R0X1R2	2WZKUL1R0X1R2
		1.2/1.2mm		2WZKKVY1R2X1R2	

Table 3

2.03 Specifications

MODEL	Inverter Mig 165	Inverter Mig 200
Input voltage and frequency and phases	220/240V 1ph	220/240V 1ph
KVA @ max output	5.8KVA	8.1KVA
Max current	160A	200A
Output current range	30~160A	30~200A
Open circuit voltage	62/68V	62/68V
Duty cycle at 40℃	60%	60%
Weight	30Kg	31Kg
Dimensions	450×210×470	450×210×470

Table 4

2.04 Duty Cycle

The duty cycle of a welding power source is the percentage of a ten (10) minute period that it can be operated at a given output without causing overheating and damage to the unit. If the welding amperes decrease, the duty cycle increases. If the welding amperes are increased beyond the rated output, the duty cycle will decrease.

WARNING: Exceeding the duty cycle ratings will cause the thermal overload protection circuit to become energized and shut down the output until has cooled to normal operating temperature

Continually exceeding the duty cycle ratings can cause damage to the welding power source.

NOTICE：

Due to variations that can occur in manufacture products, claimed performance, voltages, ratings, all capacities, measurements, dimensions and weights quoted are approximate only. Achievable capacities and ratings in use and operation will depend upon correct installation, use, applications, maintenance and service.

3.0 OPERATOR CONTROLS

3.01 INVERTER MIG Series controls

Figure 2

1. Main Circuit Bleaker—Switching to the ON position energizes the welding power source.
2. Wire Feed Speed Control.
3. Voltage Control.
4. 14-Pin Receptacle—Used to connect the wire feeder.
5. Positive Terminal—50mm Screw receptacle.
6. Negative Terminal—50mm Screw receptacle.
7. Terminal—Use to connect the torch.
8. Selector Control—2T / 4T
9. Inductance Control.
10. Meter Selection.
11. Digital Meter.
12. Warning Indicator—Activates under the following conditions:
    - Input voltage is too low/ too high
    - Thermal overload
13. AC Power Indicator—Lights when in the ON position.
14. Input Gas Fitting.
15. Fuse.

16. 110VAC Auxiliary Power.
17. Ground screw—Ground cable.
18. Input Power Cable Port.
19. Burnback (Inside).

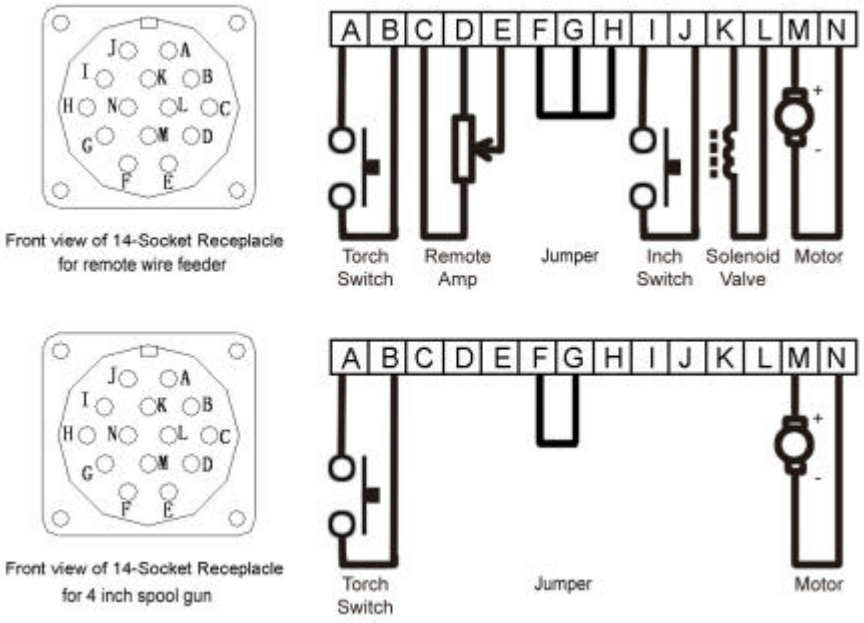


Figure 3

Pin	WF2 function	4 inch spool gun function
A	Torch switch input	Torch switch input
B	Torch switch input	Torch switch input
C	Current regulation	
D	Current regulation	
E	Current regulation	
F	Short line	Short line
G	Short line	Short line
H	Short line	
I	Spot switch	
J	Spot switch	
K	Solenoid valve	
L	Solenoid valve	
M	WF2 motor	Spool gun motor
N	WF2 motor	Spool gun motor

Table 5

WARNING

When the welder is connected to the primary supply voltage, the internal electrical components maybe at primary potential with respect to earth.

3.02 INVERTER MIG Series Control Methods

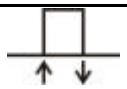
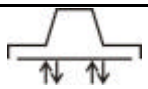
Weld Control	MIG/MAG	Description
 2T Mode	Yes	2T mode MIG
 4T Mode	Yes	4T mode MIG
Spot mode	No	Spot mode MIG

Table 6 Inverter Mig series selection of weld technology in different weld methods

3.03 Weld parameter description

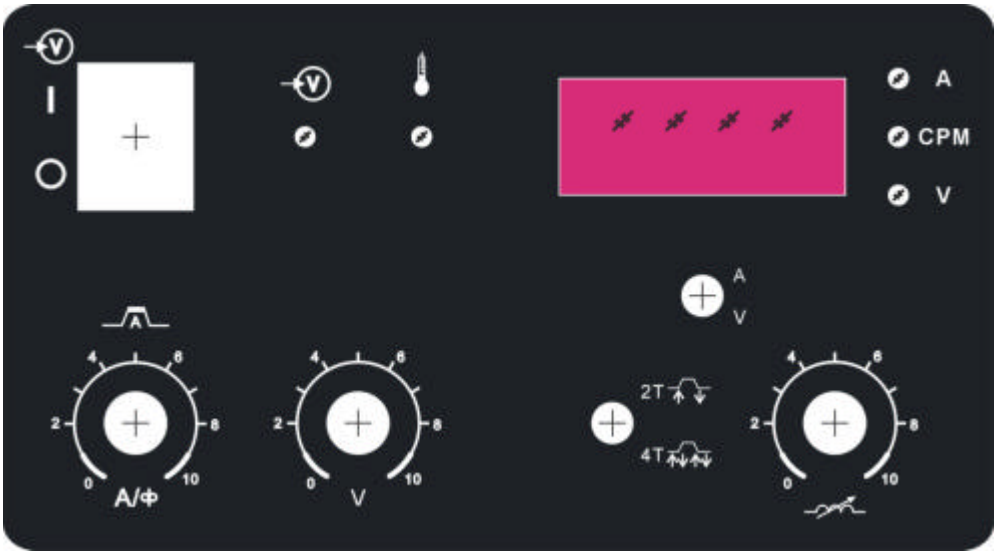


Figure 4 Inverter Mig series front panel with parameter description

Parameter	Description
Welding Current	This parameter sets the welding current.
Burnback Time	MIG only. Burnback time is the difference between the wire feed motor stopping and switching off of the welding current. The Burnback time allows the electrode wire to burn out of the molten metal weld pool, to separate the electrode wire from work piece.

Table 7 Weld parameter description for Inverter Mig series

4.0 SET-UP FOR MIG/MAG

Conventional operating procedures apply when using the welding power source, i.e. connect work lead directly to work piece and connect MIG gun to the power source. Wide safety margins provided by the coil design ensure that the welding power source will withstand short-term overload without adverse effects. The welding current range values should be used as a guide only. Current delivered to the arc is dependent on the welding arc voltage, and as welding arc voltage varies between different classes of electrodes, welding current at any one setting would vary according to the type of electrode in use. The operator should use the welding current range values as a guide, and then finally adjust the current setting to suit the application.

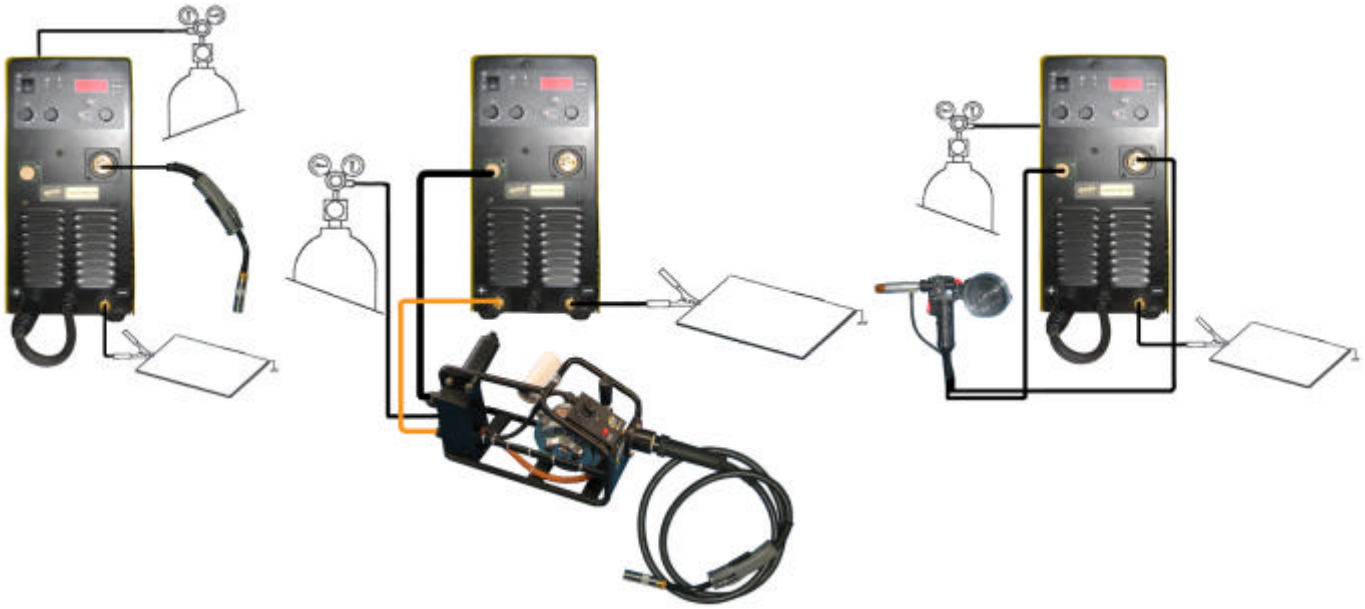


Figure 5 Set up for Inverter Mig series

WARNING:

Before connecting the work clamp to the work and inserting the electrode in the electrode holder make sure the Primary power supply is switched off.

CAUTION 2:

Remove any packaging material prior to use. Do not block the air vents at the front or rear of the Welding Power Source.

5.0 POWER SUPPLY CONTROLS INDICATORS AND REATURES

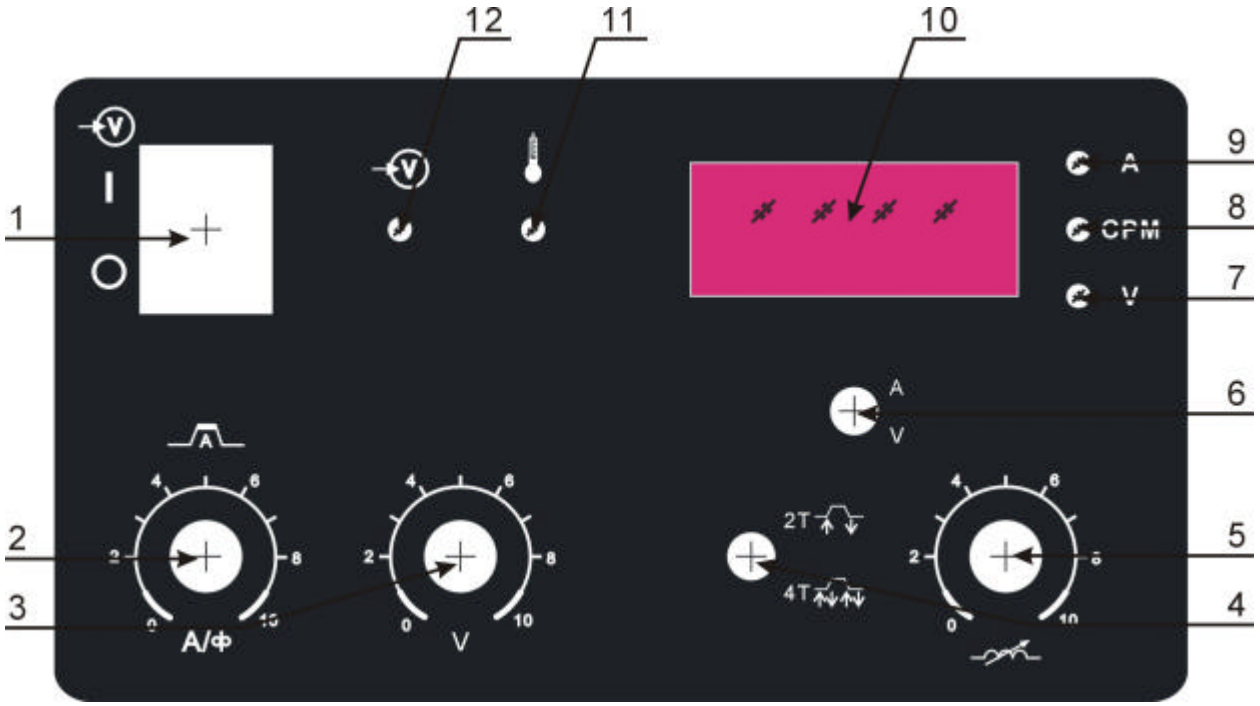


Figure 6 Inverter Mig series front panel

1. Main Power Switch.
2. Wire Feed Speed Control.
3. Voltage Control.
4. Selector Control—2T / 4T
5. Inductance Control.
6. Meter Selection.
7. Voltage Indicator.
8. Speed Indicator.
9. Amperage Indicator.
10. Digital Meter.
11. Warning Indicator.
12. AC Power Indicator.

5.01 Basic MIG Welding Guide

The welding power supply has two control settings that have to balance. These are the wire speed control and the voltage control switches. The welding current is determined by the wire speed control, the current will increase with increased wire speed, resulting in a shorter arc. Less wire speed will reduce the current and lengthen the arc. By decreasing the voltage, a shorter arc is obtained with little change in welding current, because the wire speed is not changed.

- When changing to a different electrode wire diameter, different control settings are required. A thinner electrode wire needs more wire speed to achieve the same current level.
- A satisfactory weld cannot be obtained if the wire speed and voltage switch settings are not adjusted to suit the electrode wire diameter and dimensions of the work piece.
- If the wire speed is too high for the welding voltage, “stubbing” will occur as the wire dips into the molten pool. If the wire speed is too slow for the welding voltage, large drops will form on the end of the electrode wire, causing spatter. Suppose that wire speed is constant, if the welding voltage is too high, large drops will form on the end of the electrode wire, causing spatter; if the voltage is too low, the wire will not melt.

5.02 Position of MIG Gun

The angle of MIG gun to the weld has an effect on the width of the weld run.

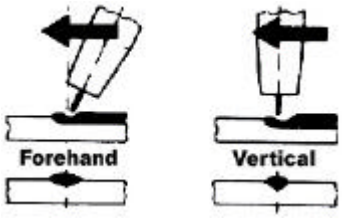


Figure 7 MIG gun angle

5.03 Distance from the MIG Gun Nozzle to the Work Piece

The electrode stick out from the MIG gun nozzle should be between 2.0mm to 5.0mm. This distance may vary depending on the type of joint that is being weld.

5.04 Travel Speed

Speed at which a weld travels influences the width of the weld and penetration of the welding run.

5.05 Electrode Wire Size Selection

The choice of electrode wire size in conjunction with shielding gas used depends on:

- Thickness of the metal to be welded.
- Type of joint.
- Capacity of the wire feed unit and power supply.
- The amount of penetration required.
- The deposition rate required.
- The bead profile desired
- The position of welding and cost of the electrode wire.

Weld metal deposition rate is proportional to current density. Current density is defined as the current per cross sectional area of electrode wire and is normally expressed as amps per mm2. An example is tabled below.

Electrode Wire Size	Current (A)	Current Density (A/mm^2)	Deposition Rate (lbs/hour)
0.9mm (.035")	200	314	7.0
1.2mm (.045")	200	177	6.2

Table 8 0.9mm/ 1.2mm wire deposition rate

This demonstrates that where the upper limit of current is limited by the machine capacity and duty cycle, higher deposition rates therefore greater productivity will be achieved by using smaller electrode wire. The Inverter Mig series is a particularity efficient MIG welder with the 0.9mm~1.2mm steel wire in spray transfer mode. 0.9mm wire cost approx. 10% more than 1.2mm but is deposited approx 15% faster.

High current density or smaller diameter wire also gives deeper penetration as shown:

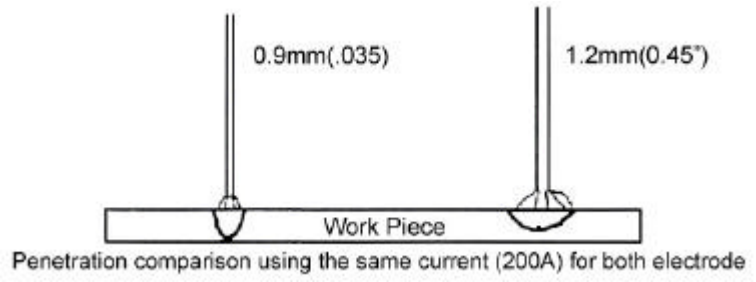


Figure 8 Wire penetration comparison

5.06 Spot Welding Operation

Fit a spot welding nozzle to the MIG gun for consistent spot welding operations. The INVERTER MIG Series power supply will operate effectively using 0.8~1.2mm electrode wire when spot welding. Penetration depth is limited when using 0.6mm electrode wire for spot welding. Set the controls as follows for spot welding:

1. Coarse & fine voltage selector switches and wire speed control.
   Select higher voltage selector switch positions and set the wire speed control between 354 to 590ipm (9~15 meters/ minute)
2. Mode selector switch.
3. Spot Time.
4. Burnback Time.

6.0 MAINTENANCE

If this equipment does not operate properly, stop work immediately and investigate the cause of the malfunction. Maintenance work must be performed by an experienced, qualified person only. Any electrical work must be performed by an electrician or other person properly trained in servicing electrical equipment. Do not permit untrained persons to inspect, clean or repair this equipment. Use only recommended replacement parts when servicing this machine.

Periodically clean the inside of the welding power source by using clean dry compressed air of not over 25psi as normal preventive maintenance. At the time of the cleaning, a full inspection of the welding machine and setup should be performed. Check warning labels on the machine for readability; replace if necessary. Check input and output connections as well as frame ground connections to the machine to insure that they are tight and the wires are not frayed or overheated. Inspect internal wiring of machine for loose or frayed connections; tighten or repair as necessary. It would also be advisable to check connections to wire feeders, fixtures, etc., at this time. Any damaged cable or hoses should be replaced.

DANGER: HIGH VOLTAGE is present internally even with the control power switch in the OFF position. Before inspecting, cleaning, or servicing, disconnect and lock out input power to the power source.

7.0 BASIC TROUBLESHOOTING

WARNING

There are extremely dangerous voltages and power levels present inside this product. Do not attempt to open or repair unless you are an accredited BOSS service agent and you have had training in power measurements and troubleshooting techniques.

If major complex subassemblies are faulty, then the welding power source must be returned to an accredited BOSS service agent for repair.

The basic level of troubleshooting is that which can be performed without special equipment or knowledge.

7.01 Check the item and excrescent phenomenon exclusion method

Troubleshooting Guide

Fault		Cause	Remedy
1. The AC power indicator light is not lit and welding arc can not be established.		1. No power input or main power switches damage. 2. Indicator damage.	1. Check input power or replace main power switch. 2. Replace indicator light.
2. The AC power indicator light on and welding arc can not be established.		1. Input voltage unstable. 2. Diode PCB damage.	1. Connect stabilizer or reset power switch. 2. Repair or replace.
3. The warning indicator light on.		Over load.	Reduce current or wait moment.
4. Turn on torch control switch	a. No gas flow No wire feed No output	1. MIG torch plug is not insert into the socket or the connect is bad. 2. MIG torch damage (diagnose method: make the welding machine control socket two pins short circuit, the faulty disappear). 3. Wire feeder plug is not insert into the socket or the connect condition is bad.	1. Insert the plug correctly, and rotate it clockwise. 2. Repair or replace MIG torch. 3. Insert the plug correctly, and rotate it clockwise.
	b. No gas flow Have wire feed Have output	1. The gas line is not turn on. 2. The MIG torch damage. 3. The solenoid damage. 4. Wire feed control PCB damage.	1. Turn on the gas system. 2. Repair or replace. 3. Repair or replace. 4. Repair or replace.
	c. Have gas flow Have wire feed No output	1. Disconnect the work piece to the work ground cable. 2. Wire feed control PCB damage.	1. Reconnect the ground cable and tighten the work piece. 2. Repair or replace.
5. Faulty welding arc control.		1. The MIG torch damage. 2. Faulty setting. 3. Main PCB damage.	1. Repair or replace the MIG torch. 2. Read this manual carefully and set up correctly. 3. Repair or replace.
6. The arc weld has no output.		1. Diode PCB bad connect. 2. Relay PCB bad connect.	1. Repair or replace. 2. Repair or replace.
7. Arc start difficult or often break off.		1. The power supply voltage is too low or the cable is too thin. 2. Control board damage. 3. The contact tip damage. 4. The work piece bad connect. 5. The drive roller damage. 6. The torch lead damage.	1. Connect a stabilizer or increase the thickness of the power cable. 2. Repair or replace. 3. Repair or replace. 4. Repair or replace. 5. Replace 6. Replace
8. The maximum output welding current can not achieved in the rated input voltage.		1. Control board damage. 2. Wire feed control PCB damage.	1. Repair or replace. 2. Repair or replace.
9. The current decrease in the weld process.		Faulty cable connected to work piece.	Make sure the cable positive connect to the work piece correctly.

Table 9

7.02 Solving Problems Beyond the Welding Terminals

The general approach to fix gas metal arc welding (GMAW) problems is to start at the wire spool then work through to the MIG gun. There are two main areas where problems occur with GMAW:

a) Porosity

When there is a gas problem the result is usually porosity within the weld metal. Porosity always stems from some contaminant within the molten weld pool which is in the process of escaping during solidification of the molten metal.

Contaminants range from no gas around the welding arc to dirt on the work piece surface.

Porosity can be reduced by checking the following points:

- Gas cylinder contents and flow meter
  Ensure that the gas cylinder is not empty and the flow meter is correctly adjusted to 15 liters per minute (0.5 cubic feet per minute)
- Gas leaks
  Check for gas leaks between the regulator/ cylinder connection and in the gas hose to the power supply.
- Internal gas hose in the power supply
  Ensure the hose from the solenoid valve to the MIG gun adaptor has not fractured and that it is connected to the MIG gun adaptor.
- Welding in a windy environment
  Shield the weld area from the wind or increase the gas flow.
- Welding dirty, oily, painted oxidized or greasy plate.
  Clean contaminates off plate.
- Distance between the MIG gun
  Keep the distance between the MIG gun nozzle and the work piece to a minimum. Refer to distance from the MIG gun nozzle to the work piece in 5.03.
- Maintain the MIG gun in good work order
  Ensure that the gas holes are not blocked and gas is exiting out of the gun nozzle. Refer to the WARNING.

Do not restrict gas flow by allowing spatter to build up inside the MIG gun nozzle.

Check that the MIG gun O-rings are not damaged.

WARNING: Disengage the drive roll when testing for gas flow by ear.

b) Inconsistent wire feed

Wire feeding problems can be reduced by checking the following points:

- Wire spool brake is too tight
  Feed roller driven by motor in the cabinet will slip.
- Wire spool brake is too loose
  Wire spool can unwind and tangle.
- Worn or incorrect feed roller size

Use “U” groove drive feeder roller matched to the aluminum wire size you are welding.
Use “V”’ groove drive feeder roller matched to the steel wire size you are welding.
Use “knurled V”’ groove drive feeder roller matched to the flux cored wire size you are welding.

- Mis-alignment of inlet/ outlet guides
  Wire will rub against the mis-aligned guides and reduces wire feed ability.
- Liner blocked with debris
  Debris is produced by the wire passing through the feed roller, if excessive pressure is applied to the pressure roller adjuster.
  Debris can also be produced by the wire passing through an incorrect feed roller groove shape or size.
  Debris is fed into the liner where it accumulates thus reducing wire feed ability.
- Incorrect or worn contact tip
  The contact tip transfers the weld current to the electrode wire. If the hole in the contact tip is too large then arcing may occur inside the contact tip resulting in the electrode wire jamming in the contact tip.
  When using soft electrode wire such as aluminum it may become jammed in the contact tip due to expansion of the wire when heated. A contact tip designed for soft electrode wires should be used.
- Poor work lead contact to work piece
  If the work lead has a poor electrical contact to the work piece then the connection point will heat up and result in a reduction of power at the arc.
- Bent liner
  This will cause friction between the wire and the liner thus reducing wire feed ability.

7.03 Weld Problems

Fault	Cause	Remedy
1. Undercut	A Welding arc voltage too high. B Incorrect gun angle. C Excessive heat input.	A Reduce voltage by reducing the voltage selection switches position or increase the wire feed speed. B Adjust angle. C Increase the gun travel speed and/ or reduce welding current by reducing the voltage selection switches position or reducing the wire feed speed.
2. Lack of penetration	A Welding current too low. B Joint preparation too narrow or gap too tight. C Shielding gas incorrect.	A Increase welding current by increasing wire feed speed and increasing voltage selection switch position. B Increase the joint angle or gap. C Change to a gas which gives higher penetration.
3. Lack of fusion	Voltage too low.	Increase voltage by increasing voltage selection switch position.
4. Excessive spatter	A Voltage too high. B Voltage too low.	A Lower voltage by increasing wire speed control or reducing the voltage selection switches. B Raise voltage by reducing wire speed control or increasing the voltage selection switches.
5. Irregular weld shape	A Incorrect voltage and current settings. Convex, voltage too low. Concave, voltage too high. B Wire is wandering. C Incorrect shielding gas. D Insufficient or excessive heat input.	A Adjust voltage and current by adjusting the voltage selection switches and the wire speed control. B Replace the contact tip. C Check shielding gas. D Adjust the wire speed control or voltage selection switches.
6. Welding cracking	A Weld beads too small. B Weld penetration narrow and deep. C Excessive weld stress. D Excessive voltage. E Cooling rate too fast.	A Decrease the travel speed. B Reduce current and voltage and increase MIG gun travel speed or select a lower penetration shielding gas. C Increase weld metal strength or revise design. D Decrease the voltage by reducing the voltage selection switches. E Slow the cooling rate by preheating part to be weld or cool slowly.
7. Cold weld puddle	A Faulty rectifier unit. B Loose welding cable connection. C Low primary voltage.	A Have an accredited BOSS service agent to test then replace the faulty component. B Check all welding cable connections. C Contact supply authority.

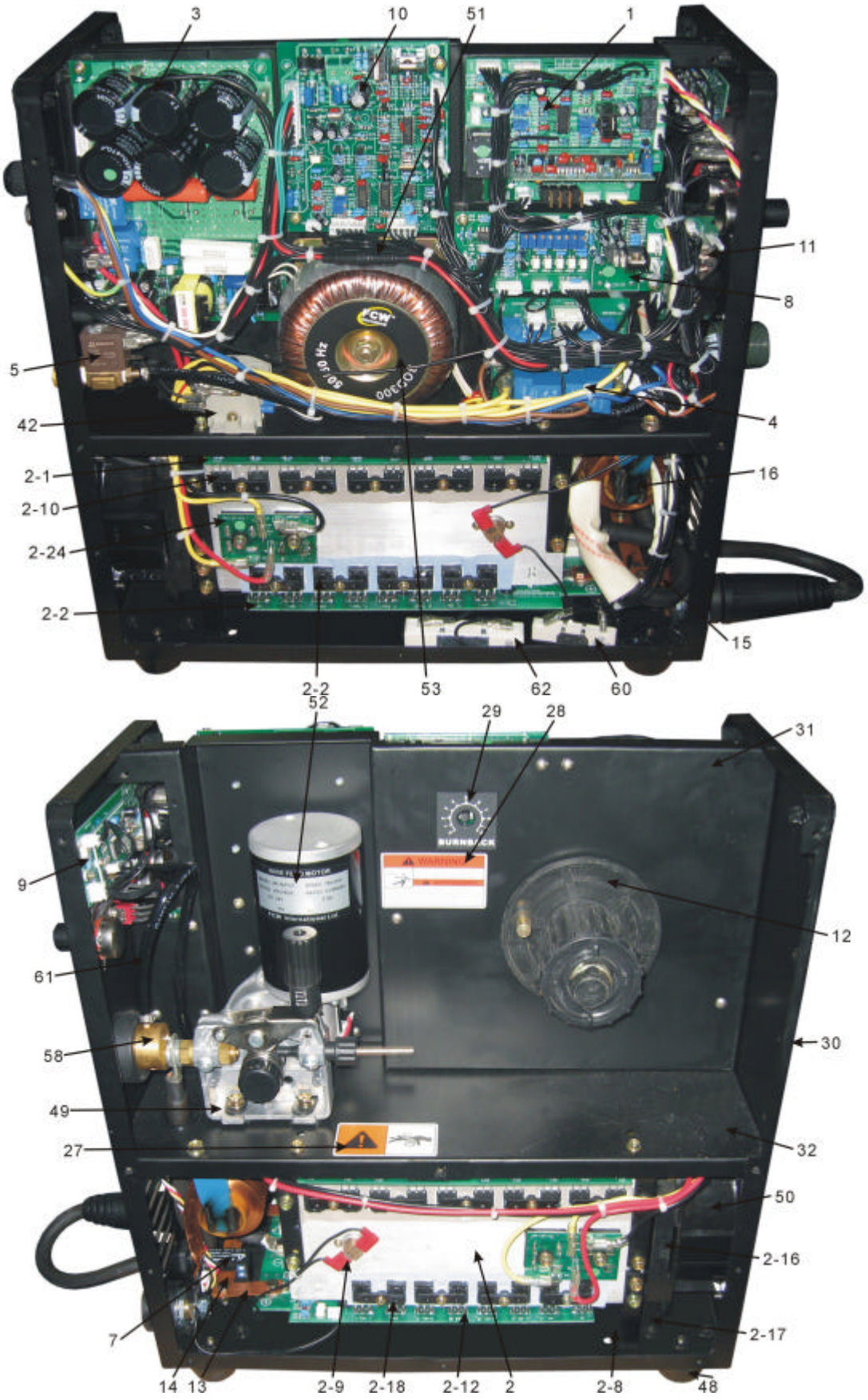
Table 10

7.04 Power Supply Problems

Fault	Cause	Remedy
1. Input power supply voltage is ON. Indicator light is not lit and welding arc can not be established.	A Primary fuse is blown. B Broken connection in primary circuit.	A Replace Primary fuse. B Have an accredited BOSS service agent check primary circuit.
2. Input power indicator light is not lit and welding arc can not be established.	Indicator light is open circuit.	Have an accredited BOSS service agent replace indicator light.
3. Input power supply is ON and indicator light is lit but when the gun trigger switch is depressed nothing happens.	Gun trigger switch leads are disconnected.	Reconnect.
4. Input power supply voltage is ON, no wire feed but gas flows from the MIG gun when the gun trigger switch is depressed.	A Electrode wire stuck in conduit liner or contact up (burn-back jam). B Faulty control PCB.	A Check for clogged/ kinked MIG gun conduit or worn contact tip, replace faulty components. B Have an accredited BOSS service agent investigate the faulty.
5. Wire feeds when the gun trigger switch is depressed but arc can not be established.	Poor or no work lead connection.	Clean work clamp area and ensure good electrical contact.
6. Wire continues to feed when the gun trigger switch is released.	The mode selector switch has been set to 4T (latch operation).	Set the mode selector switch to 2T (normal operation).
7. Jerky wire feed.	A Worn or dirty contact tip. B Worn feed roll. C Excessive back tension from wire reel hub. D Worn, kinked or dirty conduit liner.	A Replace. B Replace. C Reduce brake tension on spool hub. D Clean or replace conduit liner.
8. No gas flow.	A Gas hose is cut. B Gas passage contains impurities. C Gas regulator turned off.	A Replace or repair. B Disconnect gas hose from the rear of Inverter Mig series or then raise gas pressure and blow out the impurities. C Turn on the gas regulator.
9. Gas flow continues after the gun trigger switch has been released.	Gas valve has jammed open due to impurities in the gas or gas line.	Have an accredited BOSS service agent repair or replace gas valve.

Table 11

8.0 PART LIST


3
10
51
1
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42
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16
2-10
2-24
2-2
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2-2
53
62
60
52
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12
61
30
58
49
27
32
50
2-16
2-17
7
14
13
2-9
2-18
2-12
2
2-8
48

Figure 9

Sequence	Order No	Name	QTY.	
			Inverter Mig 165	Inverter Mig 200
1	3KITP000505052	BOARD,PCB,CONTROL (7.820.507A-03)	1	1
2	3KITP000206014	OUTPUT 200M	1	1
2-1	3KITP000506010	BOARD,PCB,MOSFET (7.820.052-03)	1	1
2-2	3KITP000506024	BOARD,PCB,DIODE (7.827.002A-01)	1	1
2-3	2HS7061048	HEATSINK LEFT-LOWER (Inside)	1	1
2-4	2HS7061049	HEATSINK LEFT-UPPER-A (Inside)	1	1
2-5	2HS7061050	HEATSINK LEFT-UPPER-B (Inside)	1	1
2-6	2HS7061046	HEATSINK RIGHT-UPPER (Inside)	1	1
2-7	2HS7061047	HEATSINK RIGHT-LOWER (Inside)	1	1
2-8	2FPPM8610007	BRACKET MOUNTING AL	1	1
2-9	4KNCR0T95	THERMOSTAT SD302	2	2
2-10	4VQK2SK2837	MOSFET 2837	20	20
2-11	4V2HMM20FU020BC812	DIODE ULTRA FAST RECOVERY	16	16
2-12	4LZQ4X2X5	HOSE FERRITE 4*2*5	48	48
2-13	2FP8647002	INSULATOR II (Inside)	27	27
2-14	2FP8647003	INSULATOR I (Inside)	1	1
2-15	2FPBM8610038	BRACKET,HEATSINK MOUNTING (Inside)	2	2
2-16	2FPBM8610039	BRACKET,HEATSINK MOUNTING I	4	4
2-17	2FPBM8610040	BRACKET,HEATSINK MOUNTING II	2	2
2-18	2FPPP8610117	BRACKET,MOSFET/DIODE (8.610.117)	15	15
2-19	2FPPP8610118	BRACKET,MOSFET/DIODE (8.610.118) (Inside)	2	2
2-20	2FP7840020	INSULATOR,HEATSINK (Inside)	1	1
2-21	2FP7854011	SPACER,NYLON 凹 D5 (Inside)	18	18
	4BFTDQ001D5	SPACER,NYLON 凸 D5 (Inside)	18	18
2-22	2FP7854012	SPACER,NYLON 凹 D3 (Inside)	6	6
	4BFTDQ003D3BK	SPACER,NYLON 凸 D3 (Inside)	6	6
2-23	2FP7854015	SPACER,NYLON 凹 D4 (Inside)	2	2
	4BFTDQ003D3BK	SPACER,NYLON 凸 D3 (Inside)	2	2
2-24	3KITP002001010	BOARD,PCB,RECTIFIER (7.827.007)	2	2
3	3KITP000107008	BOARD,PCB,POWER (7.823.003-01)	1	1
4	3KITP002601202	BOARD,PCB,RELAY-INPUT (7.828.009)	1	1
5	3KITP000112005	VALVE DC24V	1	1
6	3KITP002701030	BOARD,PCB,FILTER (7.820.006C-02) (Inside)	1	1
7	4SNOCS300B	SENSOR 300B	1	1
8	3KITP002706016	BOARD,PCB,DISPLAY-B (7.824.002B-02)	1	1
9	3KITP002706011	BOARD,PCB,DISPLAY-A (7.824.002A)	1	1
10	3KITP003403000	BOARD,PCB,CONTROL-WIRE DRIVE(7.820.506A-02)	1	1
11	3KITP002205030	BOARD,PCB,RELAY (7.828.011-01)	1	1
12	2BAR65000	SUPPORT SPOOL	1	1

13	3BB7725083	BUS BAR,POSITIVE	2	2
14	3BB7725084	BUS BAR,POSITIVE	1	1
15	3BB7725085	BUS BAR,OUTPUT	1	1
16	3EER22006	ASSY,OUTPUT INDUCTOR	1	1
17	2LAC8807133	OVERLAY CONTROL 200M	1	1
18	2LAF8802164	LABEL POWER 200M BOSS		1
18		LABEL POWER 165M BOSS	1	
19	2LAU8803009	LABEL (+)	1	1
20	2LAU8803010	LABEL (-)	1	1
21	2LAN8808306	LABEL MANUFACTURERS RATING 200M BOSS		1
21		LABEL MANUFACTURERS RATING 165M BOSS	1	
22	2LAM8800003	LABEL GROUND	1	1
23	2LAU8801001	LABEL GAS INPUT	1	1
24	2LAM8800001	LABEL VOLTAGE INPUT 240V 1PH	1	1
25	2LAM8806009	LABEL FUSE	1	1
26	2LAM8806020	LABEL AUXILIARY POWER 115V 1PH	1	1
27	2LAW8805002	LABEL WARNING	1	1
28	2LAW8805004	LABEL WARNING	1	1
29	2LAC8807053	LABEL BURNBACK	1	1
30	2FPB6123016	BASE	1	1
31	2FPBG6153001	PANEL CENTER	1	1
32	2FPUT8038029	PANEL UPPER TRAY	1	1
33	2FBM8604059	BRACKET DISPLAY-B MOUNTING (Inside)	1	1
34	2FBM8604073	BRACKET 14 PIN MOUNTING (Inside)	1	1
35	2FP7854004	INSULATOR BULKHEAD FRONT	2	2
36	2FP7854008	INSULATOR BULKHEAD REAR	2	2
37	2GS50CC001FP	RECEPTACLE,TWIST LOCK(FEMALE) POWER	2	2
38	4KCD221BK	SWITCH	1	1
39	4SXJPG13R5	BUSHING,STRAIN RELIEF PG13.5	1	1
40	2FP7854018	PROTECTION FOR EURO CONNECTOR	1	1
41	4KCD221BK	KNOB	3	3
42	4CC010206	TERMINAL 2*5	1	1
43	4FUSH15X250XD6	FUSE HOLDER	1	1
44	4XSP6BH3	SOCKET 115V	1	1
45	4FANCSA1725	FAN COVER	1	1
46	4WRKSSBS26	BUSHING SNAP BS26 (Inside)	2	2
47	4WRNB1216	BUSHING SNAP (Inside)	1	1
48	4JFT35X50	MOUNT NPRN	4	4
49	2FP7854018	INSULATOR WIRE DRIVE	2	2
50	4FAN001SA1725	FAN	1	1
51	4FUSH5A	FUSE LINE HOLDER	1	1

52	4ZK76ZY01	WIRE DRIVE	1	1
53	4EER400112	TRANSFORMER CONTROL BOD300	1	1
54	4WTH1A2W5K	POTENTIONMETER 2W 5K	2	2
55	4WTH1A2W100K	POTENTIONMETER 2W 100K	1	1
56	4KNX202	SWITCH KNX202	2	2
57	481CC3KV103	CAPACITOR 3KV103 (Inside)	1	1
58	2BGER90620	EURO CONNECTOR	1	1
59	4WP143102A	RECEPTACLE 14 PIN	1	1
60	4RX27D20W0R47H	RESISTOR 20W 0.47 OHM	1	1
61	8HPVC5X8BK001	GAS HOSE 5*8	0.82M	0.82M
62	4RX27D50W500H	RESISTOR 50W 500 OHM	1	1
63	2FPPT8040030Y	PANEL TOP	1	1
64	2FPPT6170014Y	PANEL LEFT SIDE UPPER	1	1
65	2FPPT8048017Y	PANEL LEFT SIDE LOWER	1	1
66	4HDL00004	HANDLE	1	1
67	2PST8634002	LATCH SLIDE	2	2
68	2LAW8805000	LABEL WARNING	1	1
69	2LAS8809040	LABEL BOSS	2	2
70		BRACKET,MOUNTING (8.604.059) (Inside)	1	1

Table 12

9.0 REMARK

9.1 Welding machines rear panels meet the plume to have good to turn on the earth grounding, by guarantees the welder safety. When welder operation, should wear protects the mirror, the glove, puts on protects the clothing.

9.2 When the electrical network voltage is higher than 240V/260V, the out-put will appear the class, the overload, the welding machine automatically has stopped outputting and giving the red candle demonstration warning.

9.3 Ambient temperatures high when big electric current long time continuous working, the welding machine has stopped because of the heat outputting, gets down until the temperature drop only then restores.

9.4 When welding machines do not use temporarily, its depository should maintain dryly, cleanly. The environment relative humidity is not bigger than 85%.

9.5 Storing ambient temperature is -25℃~ +55℃.

9.6 When long-time does not use, every two months should electrify a time, a humidity month of every two week should electrify use a time, by use own thermal row of tide.